

# **China Crop Environment Brief: 1977 Fifth Report, October 1977**

An Intelligence Assessment

**Secret**

*GC CEB 77-006  
October 1977*

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#### FOREWORD

This is the fifth in a series of China Crop Environment Briefs which are being prepared to assist in the refinement of crop production estimates of the Peoples Republic of China. These all-source experimental analyses will be produced monthly through early December 1977. Additional ad hoc briefs will be prepared as warranted by developments. The scope and format of the briefs may vary according to the nature of conditions reported and the perceived utility of the findings.

Within the CIA, cooperative efforts of the Environment and Resource Analysis Center (ERAC) of the Office of Geographic and Cartographic Research and the China Division of the Office of Economic Research facilitated the preparation of this brief. In addition, informal consultations were held with the Foreign Agricultural Service, U.S. Department of Agriculture. The brief was written by a multidisciplinary team housed in ERAC -- composed of personnel from both CIA organizations -- representing the disciplines of geography, economics, agronomy, and meteorology.

#### METHODOLOGY

25X1D : All intelligence sources -- [REDACTED] 25X1D  
[REDACTED] meteorological data as well as traditional sources such as human intelligence reporting, translations, and the open literature -- are being exploited to produce integrated crop environment analyses. The combination of methodologies used is evolving and will be refined and expanded as experience is accumulated and new data inputs become available. A more complete statement of the methodologies employed will be published later.

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KEY POINTS

The above normal precipitation condition that existed this past summer over large areas of China has abated. Its effects, however, are still being felt.

Crops in northern China and central China continue to suffer water damage. Damage was most severe in parts of Hopeh, Honan, and Shantung Provinces.

Drought conditions existed in parts of Shantung Province.

Crop and harvest conditions were excellent in Northeast China.

The late rice crop was growing well in Kwangtung Province.

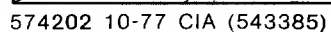
Tropical storm systems apparently caused relatively little crop damage in East and South China.

NOTE: This paper was produced by the Office of Geographic and Cartographic Research. Comments and questions may be directed to [REDACTED] Code 143, Extension 2097.

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**Figure 1**



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## DETAILS

Flooding caused crop damage in Hopeh, Honan, Shantung, Shansi, Shensi, Anhwei, and Kiangsi Provinces. Southeastern Hopeh, northwestern Shantung, and northern Honan were most severely affected. Flood damage was less extensive along the middle Huang Ho (Yellow River) and the Yangtze River, and pockets of drought were detected in areas at the base of the Shantung Peninsula.

The flooding observed on Landsat imagery of southeastern Hopeh, northern Honan, and northwestern Shantung Provinces in early August had partially receded by the end of the month (Figures 1 and 2). In a subsequent report, the Chinese claimed that by 20 September they had quickly drained 2 million hectares of cropland. The wet conditions may also have been eased by the slackening of precipitation in September. Meteorological data indicate that southern Hopeh and northern Honan received less than 15 millimeters of precipitation in September. [REDACTED] 25X1D

[REDACTED] precludes a more current assessment of the flooding.

Most of the crop damage in Hopeh, Shantung, and northern Honan Provinces was caused by the excessive precipitation that fell earlier in the poorly drained areas. This is substantiated by a 20 September Chinese press report which states that water swelled the upper and middle reaches of the Huang Ho three times in one month; but after the turbulent flow reached the large reservoir at San-men-hsia, its force was spent and the danger of its flooding areas downstream was alleviated. Localized flooding from the Huang Ho did, however, occur in northern Honan Province [REDACTED] 25X1D

25X1C [REDACTED] crop conditions varied in Shantung and Hopeh Provinces during mid-September. The crops in Shantung south of the Huang Ho were generally in good condition, but those in northwestern Shantung and southeastern Hopeh were damaged. The affected crops included soybeans, cotton, sorghum, millet and, to a lesser extent, corn and sweet potatoes. In contrast, [REDACTED] 25X1C the corn in harvest and the sorghum crop in Peking looked good and the rice crop appeared to be in excellent condition.

According to a 7 September Chinese radio broadcast, the area in Shantung that straddles the base of the peninsula from north to south had been hit by drought. More than 900,000 hectares -- about one-tenth of cultivated acreage in the province -- was

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affected. The masses were mobilized to protect the autumn crop, and it is claimed that by 5 September, 500,000 hectares had been watered. Less than 20 millimeters of precipitation reportedly fell on this area in September.

Landsat imagery reveals that shallow water covered numerous fields along the middle course of the Huang Ho in southeastern Shensi, at the border with Shansi and Honan Provinces (Figure 1). North-western Shensi experienced excessive rains and waterlogging in the "late period" this year, and weather reports indicate that during September alone an additional 100 millimeters fell. Rainfall also continued to be well above normal in Shansi, but the 50 millimeters of rain that fell in September caused little damage in this normally dry region.

High water [REDACTED] the Yangtze River Valley, primarily in Anhwei and Kiangsi Provinces (Figure 1). Some villages and fields were completely under water. A 20 September press report stated that dikes in northernmost Kiangsi and western Kiangsu Provinces were in danger of being breached, but "the situation was saved" by the modern drainage facilities. Flood damage in this area was less extensive than that observed in North China.

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Landsat imagery of Kwangtung Province shows that the intermediate rice crop had been harvested and the late rice appeared to be growing well as of mid-September. Good intermediate and late rice harvests are particularly important this year to compensate for the lower than normal early rice crop.

Ripening crops and harvested fields were observed on Landsat imagery of Heilungkiang and Kirin Provinces in early September. Well below normal precipitation allowed the fields to dry and facilitated fall harvesting operations throughout most of Northeast China.

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[REDACTED] the corn harvest was under way in Liaoning but had not been started in Kirin and Heilungkiang Provinces. This may be partly due to the reported delays in spring planting and the lower than normal temperatures this crop season. The Chinese press reported that a freezing cold wave hit several prefectures of Heilungkiang on 11 and 12 September. Meteorological data show that sub-freezing temperatures were experienced throughout northern Heilungkiang on 12 September and as far south as central Liaoning and northern Hopeh Provinces on 19 September.

Early September press reports from Kiangsi and Fukien Provinces stressed the need to actively mobilize and struggle

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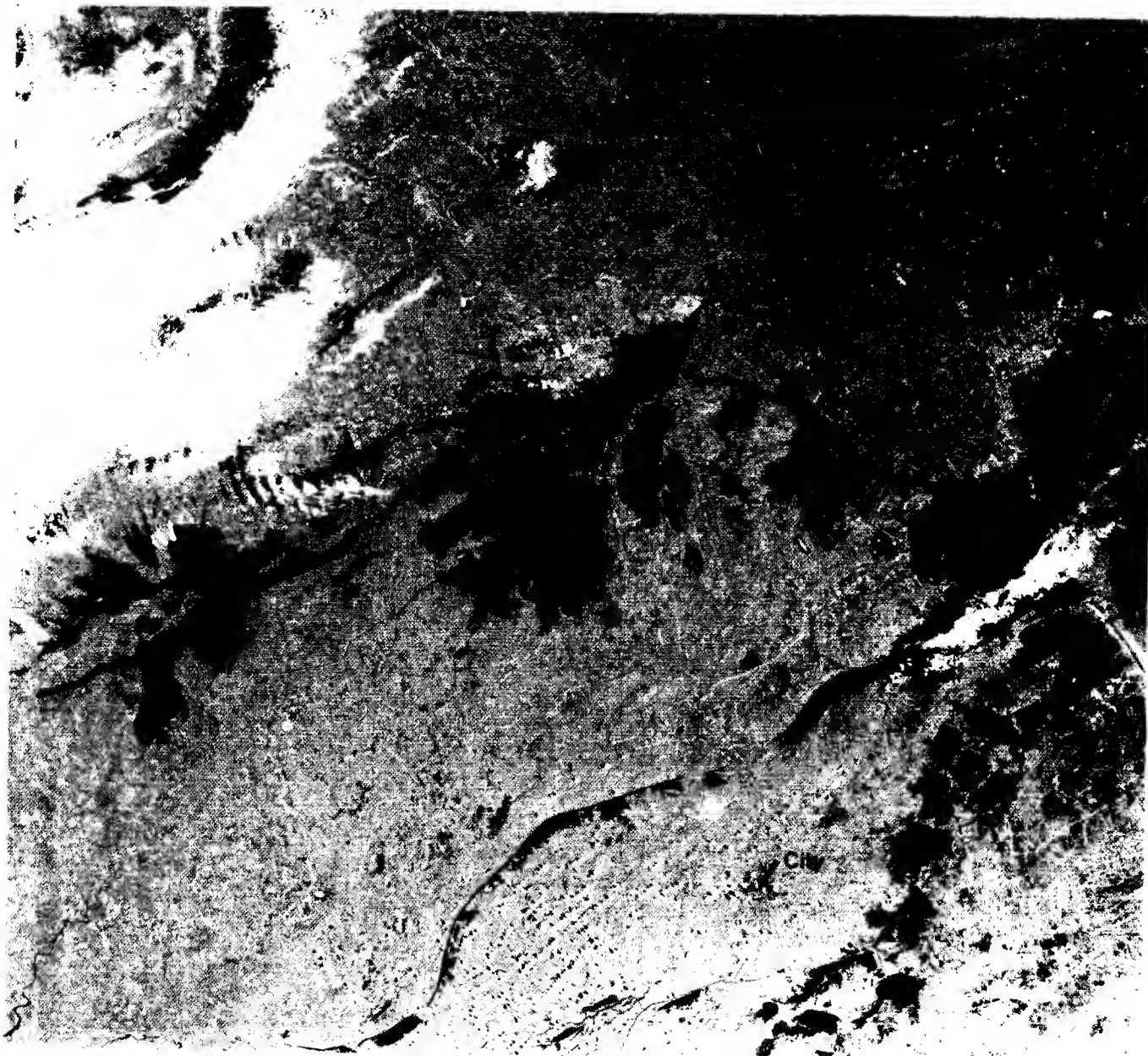
against the early "autumn cold" and the associated insects and diseases. Scattered areas in these two provinces recorded mean daily temperatures below 20°C, with one area reporting 14°C. These lower mean temperatures may reduce yields by "seriously affecting the earing and flowering" of the double-cropped late rice. Crops hit by lower temperatures are prone to rice blast infection or produce half-filled grains or small grains with no germination potential. Likewise, the large differences in day and night temperatures that have been experienced probably will reduce tillering and further lower yields.

A typhoon, three tropical storms, and a tropical depression affected East and South China during September, and associated rains extended as far inland as Szechwan and Honan Provinces. Rainfall amounts were moderate except in areas in close proximity to the storm centers where up to 100 millimeters fell in two days. Typhoon Babe struck the east coast of China on 10 September with winds of approximately 60 knots. Babe dissipated rapidly, however, by 12 September (Figure 1). In Kiangsu Province, which was hardest hit by Babe, the press claimed that the late autumn crop had "not been badly affected," although the province had also been hit by "torrential" rains in mid-August. Tropical Storm Carla skirted the southern end of Hainan Island on 3 and 4 September and dissipated in the Gulf of Tonkin. Tropical Storm Dinah passed over the southern half of Hainan Island and struck central Vietnam on 25 September before it began to dissipate (Figure 4). Tropical Storm Freda, weakening rapidly, struck the coast of southern Kwangtung Province on 25 September with gale force winds of 60 knots. A tropical depression, moving northward along the coastal areas of Fukien and Chekiang Provinces, extended the rain area northward to Kiangsu Province and as far inland as Honan Province by 26 September.

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**Tientsin Municipality and Hopeh Province**  
LANDSAT II Imagery, 10 August 1977

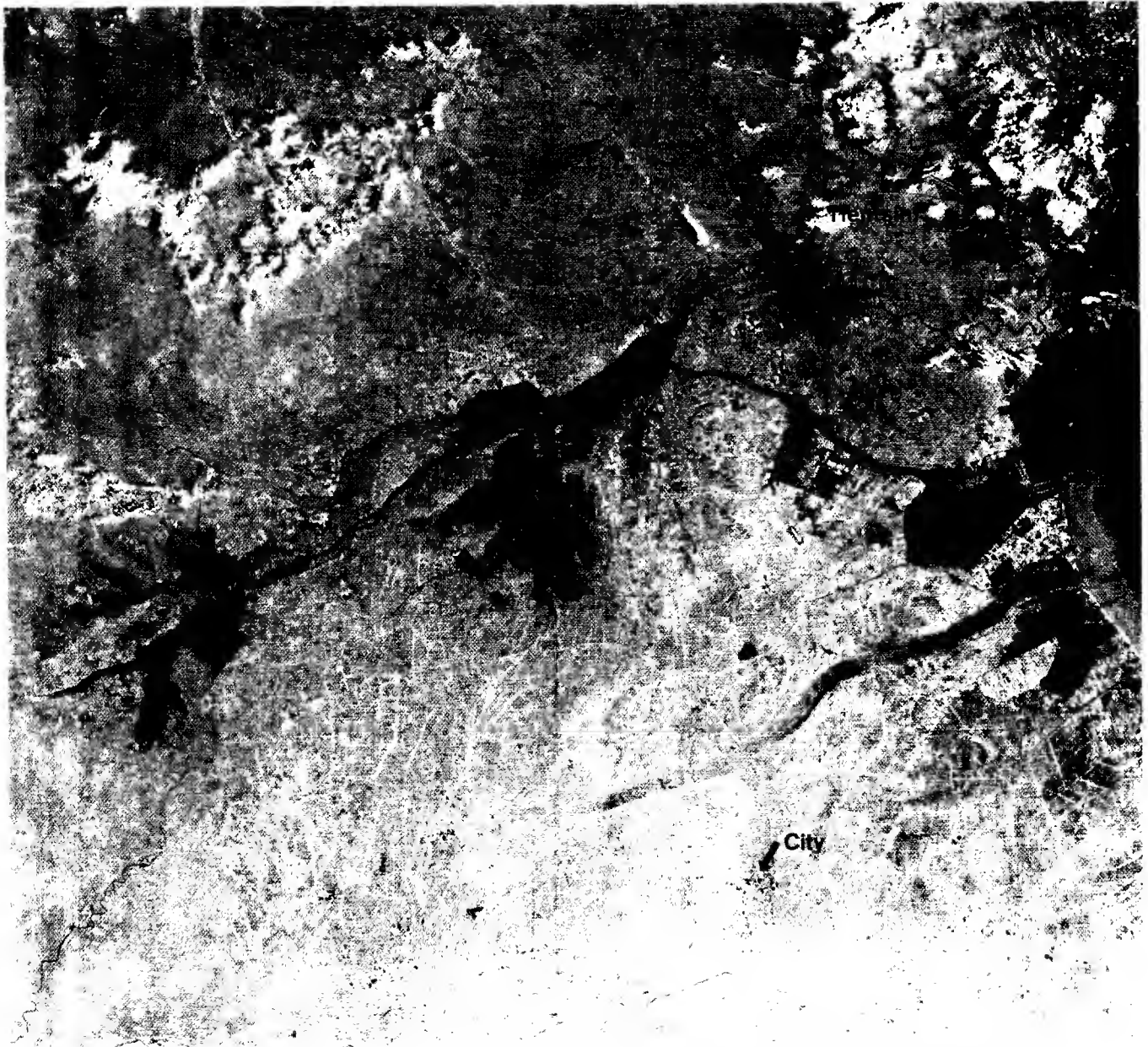


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LANDSAT II Imagery, 28 August 1977

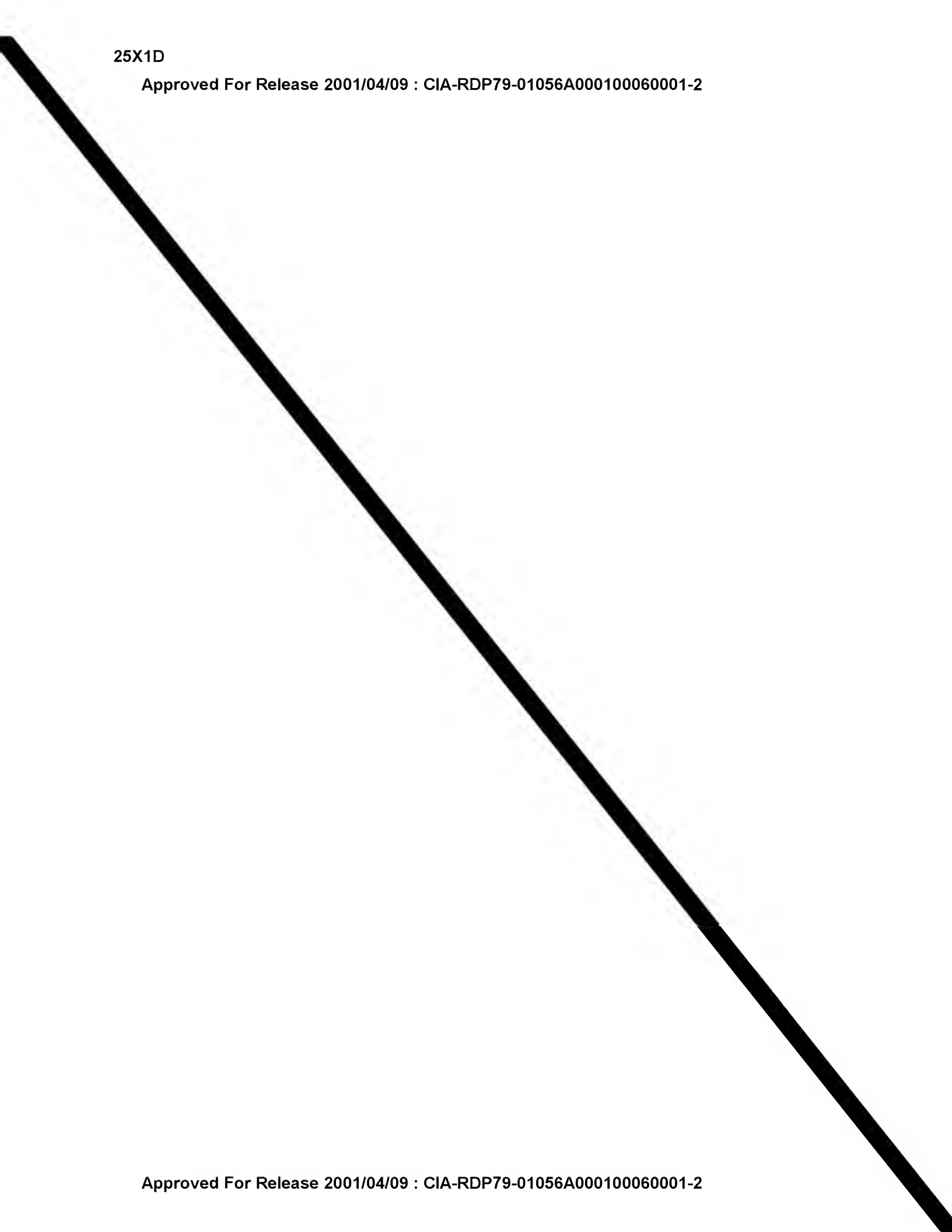
Figure 2



Partial recession of flood waters has occurred since 10 August, but severe crop losses were experienced over extensive low-lying areas in the North China Plain. The bluish-gray returns indicate fields where the water has receded and crop damage has occurred.

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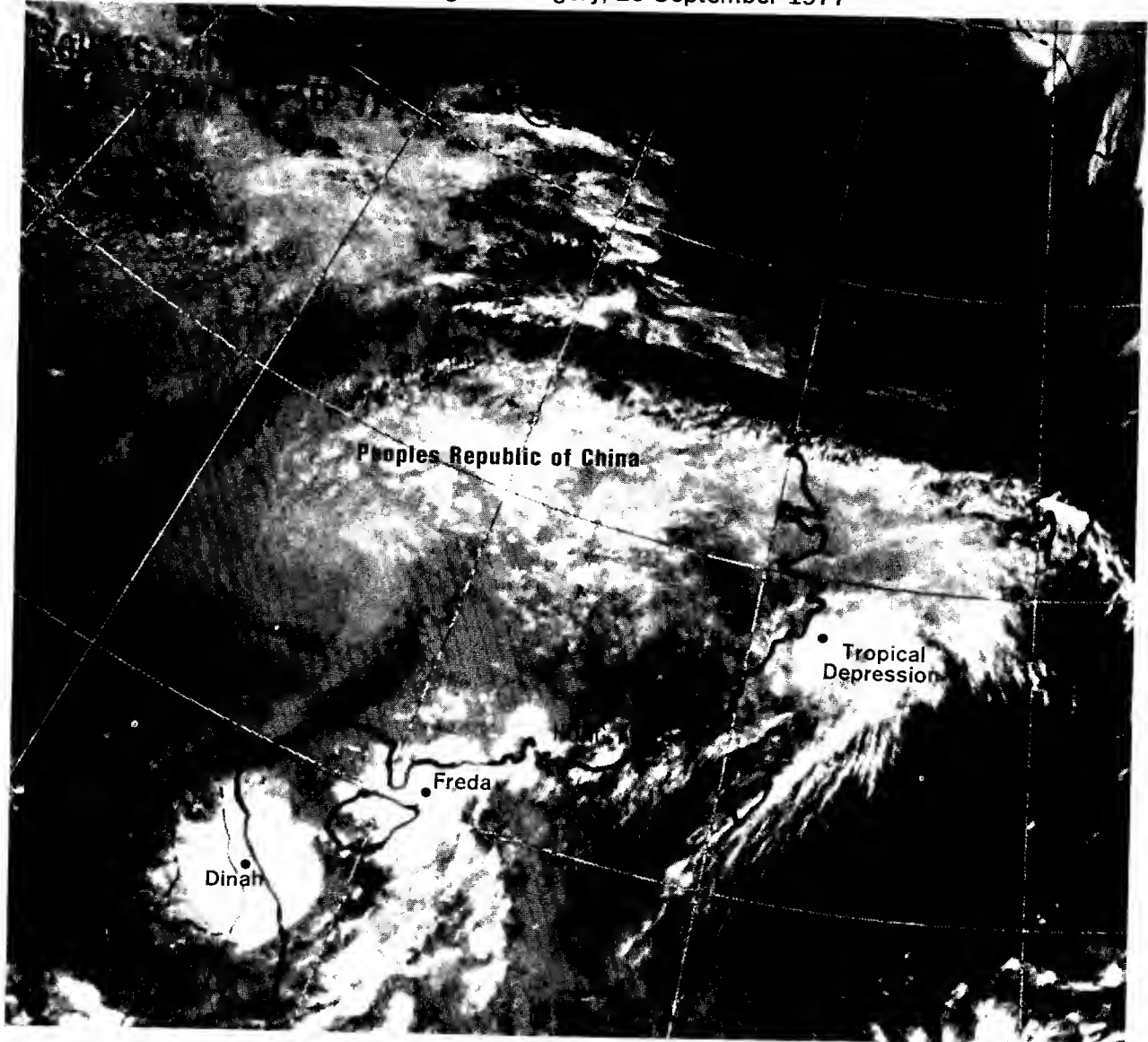
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**China-Vietnam: Remnants of Tropical Storms and Depression**  
Defense Meteorological Satellite Program Imagery, 26 September 1977

Figure 4



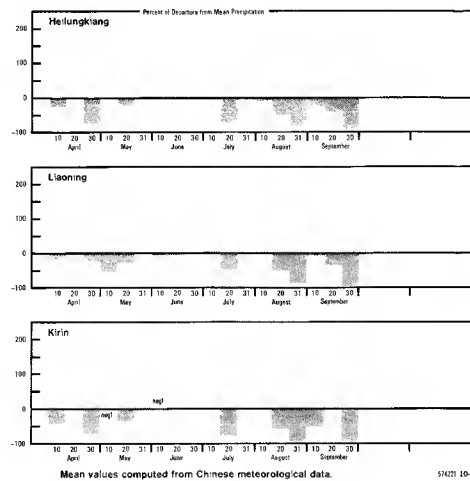
Tropical Storms Dinah and Freda had deteriorated to low pressure storm centers on 26 September. The remains of a tropical depression are visible off the East China Coast.

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**Precipitation Variations from Mean:  
Northeast China Provinces**

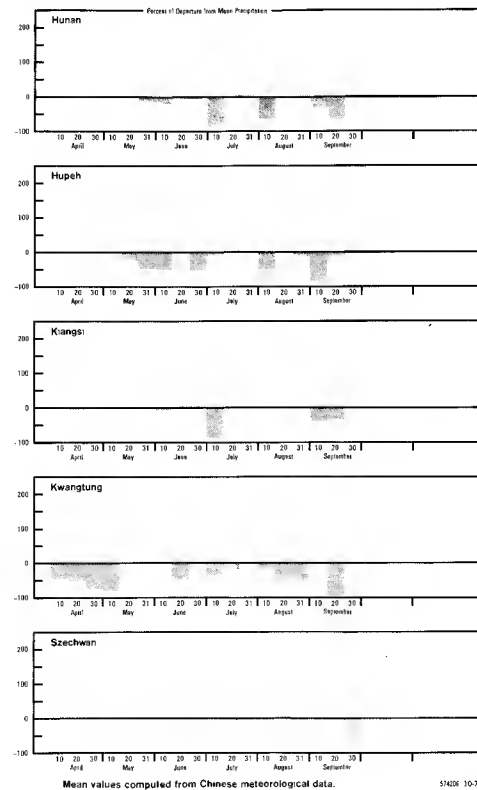
**Figure 5A**



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**Precipitation Variations from Mean:  
Selected Major Rice Growing Provinces**

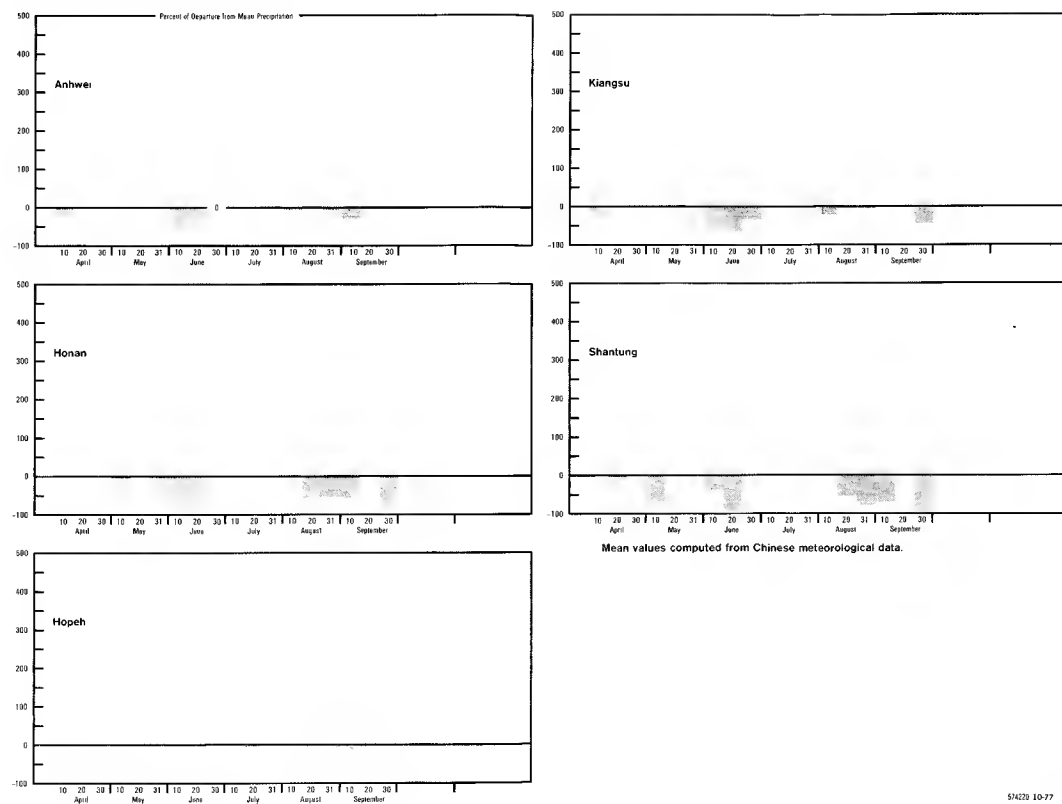
**Figure 5B**



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**Precipitation Variations from Mean:  
Provinces of the North China Plain**

**Figure 5C**



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## APPENDIX A-1

## Selected Precipitation Data

<u>Province</u>	<u>Percent of Mean Monthly Precipitation 1977</u>					
	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>
Anhwei	153.3	163.4	68.0	180.3	104.7	136.1
Chekiang	129.6	159.8	114.0	94.0	116.2	129.3
Fukien	76.0	120.7	136.5	90.3	76.9	74.4
Heilungkiang	94.3	164.1	132.8	119.9	52.6	48.1
Honan	191.0	88.9	84.9	207.2	75.4	69.8
Hopeh	157.9	259.4	199.7	180.6	93.8	44.9
Hunan	134.0	113.4	158.0	119.3	116.8	73.0
Hupei	177.6	144.0	81.0	179.9	100.4	68.5
Kiangsi	127.2	143.4	131.4	165.3	144.5	95.9
Kiangsu	149.3	153.8	49.2	133.0	96.9	131.8
Kirin	66.3	159.9	141.9	109.4	65.0	55.8
Kwangsi	74.9	127.4	150.7	126.9	94.4	119.1
Kwangtung	42.2	133.1	112.3	95.7	62.4	112.2
Kweichow	137.6	151.0	132.4	119.6	106.9	97.6
Liaoning	123.9	103.1	136.6	148.7	60.0	54.5
Shansi	183.0	157.6	182.5	157.7	124.3	82.8
Shantung	132.1	136.4	74.4	172.3	91.3	43.9
Shensi	144.4	94.6	84.0	147.5	85.7	68.3
Szechwan	136.1	98.5	84.0	153.9	80.7	76.2
Yunan	110.8	59.8	74.4	113.2	64.6	123.3

Values computed from Chinese meteorological data.

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## APPENDIX A-2

## Selected Precipitation Data

<u>Province</u>	Total Month Precipitation 1977 <u>(in millimeters)</u>					
	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>
Anhwei	134.4	162.6	108.9	242.5	134.5	115.2
Chekiang	167.7	251.8	273.7	125.0	177.7	197.3
Fukien	122.8	291.8	371.2	161.7	131.8	106.4
Heilungkiang	21.8	78.2	120.9	173.1	57.4	31.7
Honan	78.9	54.0	55.6	293.1	94.7	45.6
Hopeh	21.0	75.3	116.0	285.2	130.2	20.5
Hunan	205.2	227.0	332.6	170.7	158.8	52.4
Hupei	172.4	168.5	121.5	267.5	126.7	50.5
Kiangsi	264.4	340.8	358.5	194.3	178.2	81.7
Kiangsu	88.8	108.5	62.9	218.5	127.2	126.5
Kirin	16.3	66.5	134.1	157.5	83.3	32.5
Kwangsi	96.2	283.5	385.6	287.7	196.9	113.9
Kwangtung	62.8	322.2	307.2	255.6	154.3	178.7
Kweichow	135.4	246.1	263.0	207.7	159.1	100.2
Liaoning	32.3	57.0	108.4	261.0	96.8	39.5
Shansi	39.8	51.3	86.7	182.3	131.6	37.3
Shantung	33.4	51.4	53.0	240.9	126.1	28.5
Shensi	41.3	44.7	47.4	141.6	91.8	57.9
Szechwan	94.9	107.3	122.0	282.5	133.9	105.2
Yunnan	44.3	78.9	159.3	262.6	143.8	146.8

Values computed from Chinese meteorological data.

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APPENDIX B-1

Selected Temperature Data  
(Celsius)Departure from Historical  
Mean Monthly Temperature  
1977

<u>Province</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>
Anhwei	0.7	-1.8	-0.8	-1.0	-2.2	-0.9
Chekiang	0.8	-1.0	-1.6	-0.3	-2.5	-0.8
Fukien	0.1	0.6	-1.1	-0.8	-1.9	-1.0
Heilungkiang	-0.8	1.9	-1.4	0.0	-1.4	-0.6
Honan	1.3	-1.0	0.7	-0.3	-0.8	0.2
Hopeh	0.9	-0.8	-0.7	-0.6	-0.7	0.3
Hunan	1.4	-1.2	-1.8	-0.5	-1.4	-1.1
Hupei	1.5	-1.0	-0.3	0.5	-0.4	0.7
Kiangsi	-0.1	-0.5	-2.0	-1.2	-1.8	-1.1
Kiangsu	1.3	-1.8	-0.3	-0.2	-1.5	0.1
Kirin	0.3	1.6	-0.6	0.7	-0.5	0.2
Kwangsi	0.5	-0.2	-1.0	-0.7	-0.9	-1.2
Kwangtung	0.6	1.2	0.2	-0.4	-0.3	-1.0
Kweichow	-1.6	-1.6	-2.2	-1.4	-2.4	-1.4
Liaoning	0.0	-0.6	-1.9	-0.3	-1.8	-0.9
Shansi	0.6	-1.0	-1.0	-1.2	-0.8	0.0
Shantung	1.6	-1.4	0.6	0.6	-1.1	0.1
Shensi	0.0	-1.6	-1.6	-1.8	-0.6	-0.2
Szechwan	-1.2	-1.4	-1.3	-1.4	-1.4	0.6
Yunnan	-0.3	1.2	1.0	0.9	0.0	-0.1

Values computed from Chinese meteorological data.

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## APPENDIX B-2

Selected Temperature Data  
(Celsius)

<u>Province</u>	<u>Mean Monthly Temperature</u> <u>1977</u>					
	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>
Anhwei	16.0	18.8	24.7	28.1	26.0	22.1
Chekiang	17.2	20.3	23.8	28.9	27.0	24.2
Fukien	19.9	23.9	25.4	28.5	27.6	25.6
Heilungkiang	4.2	14.6	17.7	22.3	19.3	13.2
Honan	14.6	17.1	23.4	25.0	23.4	19.6
Hopeh	13.0	17.1	21.8	24.2	22.6	18.9
Hunan	18.1	20.4	24.3	28.8	27.5	23.4
Hupei	16.6	18.9	24.6	27.6	26.1	22.5
Kiangsi	17.7	20.9	24.0	28.5	26.8	23.3
Kiangsu	14.4	17.0	22.8	27.0	25.0	21.7
Kirin	6.3	14.7	17.5	22.1	19.2	14.0
Kwangsi	22.0	25.6	26.7	27.9	27.7	25.2
Kwangtung	23.1	26.9	27.9	28.7	28.6	26.8
Kweichow	17.1	19.5	21.9	24.7	23.6	20.7
Liaoning	9.5	16.5	20.3	24.5	21.7	17.0
Shansi	12.6	17.7	20.9	22.8	21.3	17.3
Shantung	14.4	17.7	24.2	27.0	24.7	20.9
Shensi	12.2	15.6	20.6	22.8	21.7	17.5
Szechwan	16.5	19.3	23.0	25.7	25.2	22.7
Yunnan	17.7	21.0	22.2	22.1	21.4	19.2

Values computed from Chinese meteorological data.

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